Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

ME Semester –III Examination Dec. - 2011

Subject code: 731204 **Date: 08/12/2011**
Subject Name: Flood Management
Time: 10.30 am – 01.00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Describe the various structural methods adopted for control of flood.	**07**
	(b)	(i) Explain briefly the following terms: (a)Rick (b) Design flood (c) Standard projected flood (d) Probable maximum flood (e) Safety margin.	**05**
		(ii) What are the recommended design flood for: (a) Spillways (b) Permanent barrages.	**02**
Q.2	**(a)**	Explain the graphical method of flood routing.	**07**
	(b)	What are the factors that affect the flood in river?	**07**
		OR	
	(b)	Write a brief note on: (i) Importance of flood estimation (ii) Causes of flood.	**07**
Q.3	**(a)**	Explain the rational method of computing the peak discharge of a small catchment.	**07**
	(b)	(i) Explain the terms flood, flood frequency and flood hydrograph.	**03**
		(ii) Write any four empirical flood formulae developed in India, clearly indicating the units of various terms involved.	**04**
		OR	
Q.3	**(a)**	What do you understand by the terms 100-year average return period flood? Briefly explain salient features of Gumbel's method of flood frequency analysis.	**07**
	(b)	Write in detailed the classification of flood by giving the appropriate examples.	**07**
Q.4	**(a)**	Describe the trial and error method of flood routing.	**07**
	(b)	If the annual flood series data for a catchment are available for N consecutive year, explain a procedure to determine a flood discharge with a return period of T (Where T > N) by using log Pearson type-III distribution.	**07**
		OR	
Q.4	**(a)**	What do you understand by routing of a flood? Write the basic equations in hydrologic reservoir routing.	**07**
Q.4	**(b)**	Describe the Modified Plus method of flood routing.	**07**

Q.5 **(a)** Derive the Muskingum channel routing equation **07**

$$O_2 = C_0 I_2 + C_1 I_1 + C_2 O_1$$

Where I_i are the inflows. C_i the constants and O_i the outflows.

(b) Explain following phenomena with sketch: **07**

(i) Attenuation of peak

(ii) Translation of peak

OR

Q.5 **(a)** Describe the problem of floods and their control with special reference to the Gujarat scene. **07**

(b) Flood-frequency computations for the river Chambal at Gandhisagar dam by using Gumbel's method, yielded the following results: **07**

Return period T (years)	Peak flood (m^3/s)
50	40,809
100	46,300

Estimate the flood magnitude in this river with a return period of 500 years.

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